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EXAMINER
MOYER, MICHAEL J

ART UNIT	PAPER NUMBER
2675	

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Please find below and/or attached an Office communication concerning this application or proceeding.

FN

FN

Office Action Summary	Application No.	Applicant(s)	
	09/823,448	PARKER, FREDERICK S.	
	Examiner	Art Unit	
	Michael J. Moyer	2675	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 19-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 19-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *16 September 2002* is: a)☒ approved b)☐ disapproved by the Examiner

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,6,8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on 16 September 2002. These drawings are acceptable and the objection is withdrawn.

Specification

2. The disclosure is objected to because of the following informalities: page 3, lines 13-18 contains the remark regarding copendency, the incorrect Serial No. was added. Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b). **Claims 1-3, 19-20, 23-25, 33-36, 43-48** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4, 6-14 and 16-20 of U.S. Patent No. 6,224,216 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the reasons set forth:

As pertaining to claims 1 and 19, Parker teaches an apparatus, a means, a circuit and a method comprising a first set of LEDs, a second set of LEDs, a display control associated with the first and second sets of LEDs and first and second light transmission guides, in which they

are called first and second optical fibers (claim 1 and 11). Furthermore, **as pertaining to claim 19,** the means function is just another way of describing a circuit, apparatus etc, and the means for routing the light from the sets of LEDs is the same as saying transmission light guides or a first and second set of optical fibers (claims 1 and 11).

As pertaining to claims 2 and 20, Parker teaches an apparatus, a means, a circuit and a method comprising a third set of LEDs, a third transmission guide, called a third set of optical fibers, and display controller associated with third set of LEDs (claims 2 and 12). Furthermore, **as pertaining to claim 20,** the means function is just another way of describing a circuit, apparatus etc, and the means for routing the light from the sets of LEDs is the same as saying transmission light guides or a third set of optical fibers (claims 2 and 12).

As pertaining to claims 3, Parker teaches the first, second, and third sets of LEDs emit red, green, and blue light, respectively (claims 3 and 13).

As pertaining to claims 23 and 34, Parker teaches a method for receiving first and second color frame image data, generating control signals with respect to the frame data, generating light having first wavelength, and a second wavelength and propagating the light from the first and second LEDs to an image device (claims 6 and 16).

As pertaining to claims 24 and 35, Parker teaches a method for receiving third color frame image data, generating a third control signal with respect to the frame data, generating a third light with a third wavelength and propagating the light from the third set of LEDs to an image device (claims 7 and 17).

As pertaining to claims 25 and 36, Parker teaches the first, second and third LEDs being able to emit red, green and blue, respectively (claim 8 and 18).

As pertaining to claims 33 and 43, Parker teaches the display or image device comprises a DMD, LCOS or LCD (claim 9-10 and 19-20).

As pertaining to claim 44-48, Parker teaches the transmission light guides, routing the light, propagating the light by three different sets of optical fibers, which are coupled to a light pipe integrators or terminals (claims 11 and 12). With each of these different forms of light guides they all are feed in to display or image device that receives the corresponding lights from the output terminal (claims 11 and 12). Also, these display or image devices can be of DMD or LCD (claim 4 and 14). Finally, Parker teaches the apparatus comprising an optical combiner or combiner to receive light from the first, second and third display or image devices (claims 11 and 12).

Claims 21-22 and 38 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-7 and 16-17 of U.S. Patent No. 6,224,216 B1 in view of Pross et al., US 6,396,466 B1. **As pertaining to claims 21-22 and 38,** Parker disclose an apparatus, a means, a circuit or method for generating light having a first wavelength, means for routing the light to an image device, means for generating a second light with second wavelength, means for routing the light to second display device, means for generating a third light with a third wavelength, means for routing the light to a third display device and a means for a display controller to control the apparatus (claims 6, 7, 16 and 17). Parker does not disclose the having multiple current sources but Pross does disclose a control circuit, includes a power source and multiple controllable current sources that are connected to each set of LEDs (col. 2, lines 50-55 and Fig. 4). It would be obvious to combine the Pross with Parker to establish the claimed invention to provide a control circuit that has multiple controllable current sources to allow each set of LEDs to function individually. This allows, per se, if one set of LEDs were to fail then the control circuit would allow the other sets to still function or operate because they would have their own current source. This helps in a sense, if they all shared a current source and one set of LEDs failed then they would all fail

because no switches would be incorporated to allow the other set of LEDs to function or receive the shared current.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 20 and 25-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With regards to claim 20, the routing of the light should not encompass the first and second sets of LEDs but rather the third set. Appropriate correction is required. With regards to claims 25-33, which depend from claim 23, they (claims 25-33) incorporate the limitations of claim 24 in which none of them depend from. Appropriate correction is required. Furthermore, the examiner will assume that claims 25-33 depend from claims 23 and 24.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-6, 19-20 and 44-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui et al. (hereinafter "Matsui"), US 6,281,949 B1 in view of Corrigan, US 6,480,634 B1.

As pertaining to claims 1 and 19 Matsui discloses a picture display method and apparatus for displaying a picture by spatially modulating the light from a light source and

projecting the modulated light (col. 1, lines 7-10). Matsui discloses circuit, means, images and data comprising two sets of LEDs or channels 12R and 12G, that generate light each having a different wavelength from each other (col. 7, lines 33-44, Fig. 2). Matsui further discloses a display controller 35 and picture signal processing circuit 31, in which it functions as described herein: the display controller drives the drive circuit for the respective colors 34R and 34G for driving the LEDs individually and the controller controls the picture signal processing circuit. A picture signal VS is entered to the circuit 31 when generates a picture signal for corresponding the each color that is stored in memory 32R and 32G, corresponding to each color. The light valve driving circuits 33R and 33G read out the respective color picture signals at a pre-set period from the picture memories 32R and 32G to drive the picture display light valves 11R and 11G, based on the read-out picture signals, respectively. The light-emitting diode driving circuits 34R and 34G drive the light-emitting diodes 12R and 12G for perpetually or suitably lighting the light-emitting diodes 12R and 12G,respectively (col. 10, lines (col. 9, lines 56-67; col. 10, lines 1-45; Fig. 2-3). Furthermore, Matsui discloses relay lenses 13R and 13G, field lenses 14R and 14G, first and second picture display light valves 11R and 11G and prism 10 for collecting all of the color picture signals (col. 2, lines 9-44; fig. 2).

As pertaining to claims 1 and 19, Matsui does not disclose a first and second light transmission guides to route light or a means for routing the light or propagating the light from the first and second sets of LEDs to a first and second display device.

As pertaining to claims 1 and 19, Corrigan discloses an invention related to image projectors, which a laser illuminated modulator produces an array of pixels and in which the array of pixels is projected on a display screen (col. 1, lines 7-11). Furthermore, Corrigan discloses a grating light valves (GLV), 78, 80 and 82. The GLVs are used for guiding the light, i.e. light transmission guides, for modulating the red, green and blue laser illuminations to

produce red, green and blue linear arrays of pixels (col. 4, lines 1-5, fig. 5). Also, Corrigan discloses many different types of light valves that can be used (col. 7, lines 34-67; col. 8, lines 1-3).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the GLVs of Corrigan with light valves of Matsui.

The suggestion/motivation for doing so would have been to provide a better display that produces brighter and more efficient images for displaying pictures. Furthermore, the GLV, produces a linear array of pixels which changes with time in response to a signal from the display electronics, each pixel configured in the reflecting mode or the diffracting mode at a given instant in time. Thus, the GLV produces sequential linear arrays of red, green, and blue pixels with each of the red, green, and blue pixels in the reflecting mode or the diffracting mode (col. 2, lines 16-23).

As pertaining to claims 2 and 20, Matsui discloses an apparatus, circuit, means, images and data for a third set of LEDs 12B that generates a light having a different wavelength from the previous two sets of LEDs (col. 7, lines 33-44, Fig. 2) and a control circuit 35. Again, Matsui does not disclose third light transmission guide from the third set of LEDs to a third display device. However, Corrigan discloses a projection system that uses lasers and and GLV to guide the light. See claim 1, for rejection. Claims 2 and 20 are dependent on claims 1 and 19, and are rejected on the same basis and what is stated above.

As pertaining to claims 3, Matsui discloses the first, second and thirds sets of LEDs emit red, green and blue, respectively (col. 7, lines 22-31). Claim 3 is dependent on claims 1-2 and is rejected on the same basis and what is stated above.

As pertaining to claims 5, Matsui discloses the first, second and thirds sets of LEDs

are light emitting diodes (col. 7, lines 22-31). Claim 5 is dependent on claims 1-2 and is rejected on the same basis and what is stated above.

As pertaining to claim 6, Corrigan discloses the light sources are laser (col. 3, lines 46-48). It is well known in the art that lasers come from diodes to produce this type of light. Claim 6 is dependent on claims 1-2 and is rejected on the same basis and what is stated above.

As pertaining to claim 44, Corrigan discloses teaches the first light transmission guide comprises a first plurality of optical fibers 48 optically coupled with one or more of the LEDs from the first set of LEDs 58 and a light pipe integrator coupled with the first plurality of optical fibers 48, and the second light transmission guide comprises a second plurality of optical fibers 50 optically coupled with one or more of the LEDs from the second set of LEDs 60 and a light pipe integrator coupled with the second plurality of optical fibers 50 and further the third light transmission guide comprises a third plurality of optical fibers 52 optically coupled with one or more of the LEDs from the third set of LEDs 62 and a light pipe integrator coupled with the third plurality of optical fibers 52 (fig. 2). Claim 44 is dependent on claims 1-2 and is rejected on the same basis and what is stated above.

As pertaining to claim 45, Matsui and Corrigan disclose a first display device to receive light from the first set of LEDs through the first transmission guide, a second display device to receive light from the second set of LEDs through the second transmission guide and a third display device to receive light from the third set of LEDs through the third transmission guide. See claims 1-2 for rejection regarding the transmission guide and display devices. Claim 45 is dependent on claims 1-2 and 44 and is rejected on the same basis and what is stated above.

As pertaining to claim 46, Matsui discloses the display device to comprise an LC type display (col. 7, lines 61-67; col. 8, lines 1-4). Claim 46 is dependent on claims 1-2 and 44-45 and is rejected on the same basis and what is stated above.

As pertaining to claim 47, Matsui discloses a prism 10 to receive light from the display devices (fig. 2). Also, Corrigan discloses an optical combiner 84 to receive light from the display devices (fig. 5). Claim 47 is dependent on claims 1-2 and 44-46 and is rejected on the same basis and what is stated above.

As pertaining to claim 48, Matsui discloses a projection lens 15 to project an image provided by the optical combiner or prism 10 (fig. 2). Also, Corrigan discloses a projection lens 88 to project an image provided by the optical combiner 84 (fig. 5). Claim 48 is dependent on claims 1-2 and 44-47 and is rejected on the same basis and what is stated above.

6. **Claims 4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui and Corrigan as applied to claim 1 or 2 above, and further in view of Kanayama, US 4,897,639.

As pertaining to claims 4, Matsui and Corrigan disclose that the LEDs emit red, green and blue.

As pertaining to claims 4, they do not disclose LEDs that emit yellow, cyan and magenta light.

Kanayama discloses three LEDs that emit yellow, cyan and magenta (col. 2, lines 50-68).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the LEDs of Kanayama with those of Matsui and Corrigan.

The suggestion/motivation for doing so would have been to provide a display that uses LEDs that are able to provide different combination of colors for viewing purposes. Claim 4 is dependent on claims 1-2 and is rejected on the same basis and what is stated above.

7. **Claims 7-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui and Corrigan as applied to claims 1 or 2 above, and further in view of Reymond, US 5,936,599 and Pross et al. (hereinafter "Pross"), US 6,396,466 B1.

As pertaining to claims 7, Matsui and Corrigan disclose what has previously been stated above.

As pertaining to claims 7, they do not disclose a first, second and third switches coupled between the display controller and the first, second and third sets of LEDs or color channels, respectively, wherein the display controller generates a compensating control signal on at least one of the first, second and third switches to compensate for a failed LED in the first, second and third sets of LEDs, respectively.

Reymond discloses a circuit that comprises one embodiment an AC power source 34 a switch 36 that is connected in series with an LED array 31 and in a second embodiment, same thing as described in the first embodiment, but with capacitor C in parallel with the array LED array, in this combination further comprising an inductor with the help the capacitor C provides an high impedance current source (col. 4, lines 51-55; col. 6, lines 1-32 and Figs. 4-5). It is also known that the switch may be of several different types, whether it is switching circuit or any type of transistor, i.e. MOSFET, BJT etc.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine a switch of Reymond with each set of LEDs of Matsui and Corrigan.

The suggestion/motivation for doing so would have been to provide a better LED circuit that is able to operate with the help of a switch the controlling circuit would function at more efficient rate. When the switch is closed it would allow the circuit to function properly but when open it would allow the LEDs to rest in a sense or to allow the circuit not to consume power thus saving power. Also the switch would help if there was a problem with that particular LED array because it would stay open, hopefully, thus allowing the circuit to operate the other LED array without using or consuming power to operate the nonfunctioning LED array.

As pertaining to claims 7, Pross discloses a control circuit, which encompasses a logic circuit that generates a signal or compensation signal that is connected to a switch and power source, in the event that entire display fails or if part of display can still function. The signal generated indicates a replacement is needed or compensation is possible (col. 3, lines 8-14; col. 4, lines 1-6).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the logic circuit of Pross with the control circuit of Matsui and Corrigan and the switches of Reymond.

The suggestion/motivation for doing so would have been to provide a display that can still function if an LED or LED set fails. In the event that a LED failed, then the switch would be able to stay open or closed, depending on the arrangement of the LEDs to allow the display to function. Thus the consumer would still have a functioning display, without having to worry to replace it. Claim 7 is dependent on claims 1-2 and is rejected on the same basis and what is stated above.

As pertaining to claim 8, Matsui discloses a switching means for switching the variable resistor or resistor for varying the voltage applied across the light emitting diodes 12R, 12G and 12B for independently adjusting the brightness of the light radiated form the light emitting diodes (col. 10, lines 23-29). Furthermore, Pross discloses the first, second, and third control signals further operate on a current level of a current source called controllable current sources to adjust the brightness of the light emitted by the first, second, and third sets of LEDs (col. 2, lines 54-55). Claim 8 is dependent on claims 1-2 and is rejected on the same basis and what is stated above.

As pertaining to claims 9, Pross discloses at least one of the first, second and third sets of LEDs further comprises of at least one set of series-parallel arrays of LEDs (col. 1, lines

3-5). Claim 9 is dependent on claims 1-2 and is rejected on the same basis and what is stated above.

8. **Claims 21-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui and Corrigan and further in view of Pross et al. (hereinafter "Pross"), US 6,396,466B1.

As pertaining to claims 21 and 22, Matsui and Corrigan disclose what has previously been stated above. See claims 1-2, and 19-20 for rejection.

As pertaining to claims 21 and 22, they do not disclose a means for providing a first, second and third current sources from a power supply to the first, second and third sets of LEDs.

Pross discloses a control circuit, includes a power source and multiple controllable current sources that are connected to each set of LEDs (col. 2, lines 50-55 and Fig. 4).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the control circuit and multiple power sources of Pross with the control circuit of Matsui and the routing of the light of Corrigan.

The suggestion/motivation for doing so would have been to provide a control circuit that has multiple controllable current sources to allow each set of LEDs to function individually. This allows, per se, if one set of LEDs were to fail then the control circuit would allow the other sets to still function or operate because they would have their own current source. This helps in a sense, if they all shared a current source and one set of LEDs failed then they would all fail because no switches would be incorporated to allow the other set of LEDs to function or receive the shared current.

9. **Claims 23-25, 27, 33-36 and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui in view of Corrigan and further in view of Hunter, US 5,724,062.

As pertaining to claim 23 and 34, Matsui discloses a picture display method and apparatus for displaying a picture by spatially modulating the light from a light source and projecting the modulated light (col. 1, lines 7-10). Matsui discloses circuit, means, images and data comprising two sets of LEDs or channels 12R and 12G, that generate light each having a different wavelength from each other (col. 7, lines 33-44, Fig. 2). Matsui further discloses a display controller 35 and picture signal processing circuit 31, in which it functions as described herein: the display controller drives the drive circuit for the respective colors 34R and 34G for driving the LEDs individually and the controller controls the picture signal processing circuit. A picture signal VS is entered to the circuit 31 when generates a picture signal for corresponding the each color that is stored in memory 32R and 32G, corresponding to each color. The light valve driving circuits 33R and 33G read out the respective color picture signals at a pre-set period from the picture memories 32R and 32G to drive the picture display light valves 11R and 11G, based on the read-out picture signals, respectively. The light-emitting diode driving circuits 34R and 34G drive the light-emitting diodes 12R and 12G for perpetually or suitably lighting the light-emitting diodes 12R and 12G,respectively (col. 10, lines (col. 9, lines 56-67; col. 10, lines 1-45; Fig. 2-3). Furthermore, Matsui discloses relay lenses 13R and 13G, field lenses 14R and 14G, first and second picture display light valves 11R and 11G and prism 10 for collecting all of the color picture signals (col. 2, lines 9-44; fig. 2). In addition, Matsui discloses in another embodiment, the controller 35 controls the light emitting diode driving the circuits 34R, 34G and 34B in a time relation to the display of the gradation pictures for red, green and blue colors in the picture display light valve, so that the light emitting diodes 12R, 12G and 12B will be turned on sequentially. The result is that the light emitting diodes are turned on in a timed relation with the display (col. 17, lines 24-36).

As pertaining to claim 23 and 34, Matsui does not disclose a) first and second color

frame image data, even though he hints at it above and b) a method for propagating the light from the first and second sets of LEDs to a first and second display device.

As pertaining to claim 23 and 34, Hunter discloses a display system that uses LEDs as it light source (col. 3, lines 8-13). Furthermore, the method incorporated for addressing the LEDs is disclosed by the steps of lighting a set of one red, one green and one blue light emitting diode in the set for a predetermined time period and shuttering the set of light emitting diodes with a liquid crystal pixel for at least a portion of the predetermined time period to thereby emit light from the shuttered pixel for selected time period (col. 3, lines 28-36).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the method of address the LEDs of Hunter with the method of Matsui.

The suggestion/motivation for doing so would have been to provide a better display that has high resolution, high brightness, and full color and to further provide persistence when changes in color perceived by the human eye (col. 3, lines 8-36).

As pertaining to claim 23 and 34, Corrigan discloses an invention related to image projectors, which a laser illuminated modulator produces an array of pixels and in which the array of pixels is projected on a display screen (col. 1, lines 7-11). Furthermore, Corrigan discloses a grating light valves (GLV), 78, 80 and 82. The GLVs are used for guiding the light, i.e. light transmission guides, for modulating the red, green and blue laser illuminations to produce red, green and blue linear arrays of pixels (col. 4, lines 1-5, fig. 5). Also, Corrigan discloses many different types of light valves that can be used (col. 7, lines 34-67; col. 8, lines 1-3).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the GLVs of Corrigan with light valves of Matsui and frame duration of Hunter.

The suggestion/motivation for doing so would have been to provide a better display that produces brighter and more efficient images for displaying pictures. Furthermore, the GLV, produces a linear array of pixels which changes with time in response to a signal from the display electronics, each pixel configured in the reflecting mode or the diffracting mode at a given instant in time. Thus, the GLV produces sequential linear arrays of red, green, and blue pixels with each of the red, green, and blue pixels in the reflecting mode or the diffracting mode (col. 2, lines 16-23).

As pertaining to claims 24 and 35, the same rejection can be made above but with regards to the third light frame, light source control signal and propagation of light, see claim 23 and 34 for rejection. Claims 24 and 35 are dependent on claims 23 and 34, respectively and are rejected on the same basis and what is stated above.

As pertaining to claims 25 and 36, Matsui discloses the first, second and thirds sets of LEDs emit red, green and blue, respectively (col. 7, lines 22-31). Furthermore, Hunter discloses the LEDs emit red, green and blue, respectively (Fig. 1). Claims 25 and 36 are dependent on claims 23-24 and 34-35, respectively and are rejected on the same basis and what is stated above.

As pertaining to claim 27, it would be obvious that Matsui controller 35 operates from a power source so as to control the drive circuits etc. Claim 27 is dependent on claims 23-24 and is rejected on the same basis and what is stated above.

As pertaining to claims 33 and 43, Matsui discloses the display device to comprise an LC type display (col. 7, lines 61-67; col. 8, lines 1-4). Claims 33 and 43 are dependent on claims 23-24 and 34-35 and are rejected on the same basis and what is stated above.

10. **Claims 26 and 37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui, Hunter and Corrigan as applied to claim 23 or 24 or 34 or 35 above, and further in view of Kanayama, US 4,897,639.

As pertaining to claims 26 and 37, Matsui, Hunter and Corrigan disclose that the LEDs emit red, green and blue.

As pertaining to claims 26 and 37, they do not disclose LEDs that emit yellow, cyan and magenta light.

Kanayama discloses three LEDs that emit yellow, cyan and magenta (col. 2, lines 50-68).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the LEDs of Kanayama with those of Matsui, Hunter and Corrigan.

The suggestion/motivation for doing so would have been to provide a display that uses LEDs that are able to provide different combination of colors for viewing purposes. Claims 26 and 37 are dependent on claims 23-24 and 34-35 and are rejected on the same basis and what is stated above.

11. **Claim 28** is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui, Hunter and Corrigan as applied to claim 23 or 24 above, and further in view of Reymond, US 5,936,599.

As pertaining to claim 28, Matsui, Hunter and Corrigan disclose what has previously been stated above.

As pertaining to claim 28, they do not disclose a first, second and third

switches coupled between the display controller and the first, second and third sets of LEDs or color channels, respectively, wherein the display controller generates a compensating control signal on at least one of the first, second and third switches to compensate for a failed LED in the first, second and third sets of LEDs, respectively.

Reymond discloses a circuit that comprises one embodiment an AC power source 34 a switch 36 that is connected in series with an LED array 31 and in a second embodiment, same thing as described in the first embodiment, but with capacitor C in parallel with the array LED array, in this combination further comprising an inductor with the help the capacitor C provides an high impedance current source (col. 4, lines 51-55; col. 6, lines 1-32 and Figs. 4-5). It is also known that the switch may be of several different types, whether it is switching circuit or any type of transistor, i.e. MOSFET, BJT etc.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine a switch of Reymond with each set of LED's of Matsui, Hunter and Corrigan.

The suggestion/motivation for doing so would have been to provide a better LED circuit that is able to operate with the help of a switch the controlling circuit would function at more efficient rate. When the switch is closed it would allow the circuit to function properly but when open it would allow the LEDs to rest in a sense or to allow the circuit not to consume power thus saving power. Also the switch would help if there was a problem with that particular LED array because it would stay open, hopefully, thus allowing the circuit to operate the other LED array without using or consuming power to operate the nonfunctioning LED array. Claim 28 is dependent on claims 23-24 and is rejected on the same basis and what is stated above.

12. **Claims 29-31, and 38-42** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui, Hunter and Corrigan as applied to claims 23 or 24 above, and further in view of Pross et al. (hereinafter "Pross"), US 6,396,466 B1

As pertaining to claims 29-30 and 40-41, Matsui and Hunter disclose that the LEDs are light emitting diodes (M: col. 7, lines 22-31; H: col. 3, lines 8-13) and Hunter and Corrigan disclose the light sources (H: col. 4, lines 38-43; C: col. 3, lines 46-48) can be laser. It is well known in the art that lasers are generated by diodes.

As pertaining to claims 29-30 and 40-41, they do not disclose the LEDs, whether light emitting or laser, are of series parallel array.

As pertaining to claims 29-30 and 40-41, Pross discloses at least one of the first, second and third sets of LEDs further comprises of at least one set of series-parallel arrays of LEDs (col. 1, lines 3-5).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the series parallel arrays method of Pross with light emitting and laser diodes of Matsui, Hunter and Corrigan.

The suggestion/motivation for doing so would have been to provide a display that uses series parallel laser diodes instead of light emitting diodes. The main reason for having a series parallel array is that they are more efficient because if one series parallel fails, it will not shut down or make the entire display inoperable because only the section will not work thus allowing the other sections to still function. Claims 29-30 and 40-41 are dependent on claims 23-24 and 34-35 and are rejected on the same basis and what is stated above.

As pertaining to claim 31, Pross discloses a control circuit, which encompasses a logic circuit that generates a signal or compensation signal that is connected to a switch and power source, in the event that entire display fails or if part of display can still function. The signal

generated indicates a replacement is needed or compensation is possible (col. 3, lines 8-14; col. 4, lines 1-6). Claim 31 is dependent on claims 23-24 and 27 and is rejected on the same basis and what is stated above.

As pertaining to claim 38, Pross discloses a control circuit, includes a power source and multiple controllable current sources that are connected to each set of LEDs (col. 2, lines 50-55 and Fig. 4). Claim 38 is dependent on claims 34-35 and is rejected on the same basis and what is stated above.

As pertaining to claim 39, Matsui discloses a switching means for switching the variable resistor or resistor for varying the voltage applied across the light emitting diodes 12R, 12G and 12B for independently adjusting the brightness of the light radiated form the light emitting diodes (col. 10, lines 23-29). Furthermore, Pross discloses the first, second, and third control signals further operate on a current level of a current source called controllable current sources to adjust the brightness of the light emitted by the first, second, and third sets of LEDs (col. 2, lines 54-55). Claim 39 is dependent on claims 34-35 and 38 and rejected on the same basis and what is stated above.

As pertaining to claim 42, Pross discloses a control circuit, which encompasses a logic circuit that generates a signal or compensation signal that is connected to a switch and power source, in the event that entire display fails or if part of display can still function. The signal generated indicates a replacement is needed or compensation is possible (col. 3, lines 8-14; col. 4, lines 1-6). It would be obvious that the control circuit can be connected to the current sources instead of the switch which would allow in the event if a current source failed or LED's failed the compensating signal would either turn that current source off or turn off the set of LED's. Claim 42 is dependent on claims 34-35 and 38 and is rejected on the same basis and what is stated above.

13. **Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui, Hunter, Corrigan and Reymond as applied to claims 23 or 24 or 28 above, and further in view of Pross.

As pertaining to claim 32, Matsui, Hunter, Corrigan and Reymond disclose what has previously been stated above related to this claim.

As pertaining to claim 32, they do not disclose a compensating control signal to operate on at least the first, second and third switches to compensate for a failed LED.

As pertaining to claim 32, Pross discloses a control circuit, which encompasses a logic circuit that generates a signal or compensation signal that is connected to a switch and power source, in the event that entire display fails or if part of display can still function. The signal generated indicates a replacement is needed or compensation is possible (col. 3, lines 8-14; col. 4, lines 1-6).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the control circuit that generates a compensation signal of Pross with the control circuit of Matsui, Hunter and Corrigan and the switches of Reymond.

The suggestion/motivation for doing so would have been to provide for a better display that is able to still function if an LED or LED set fails because of the compensation signal. In the event that a LED failed, then the switch would be able to stay open or closed, depending on the arrangement of the LEDs to allow the display to function due to the compensating signal. Thus the consumer would still have a functioning display, without having to worry to replace it. Claim 32 is dependent on claims 23-24 and 28 and is rejected on the same basis and what is stated above.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Flasck, US 5,108,172. Flasck teaches an active matrix reflective image plane module and projection system.

b) Taira et al., US 6,333,724 B1. Taira teaches a display device.

c) Scifres et al., US 4,763,975. Scifres teaches an optical system with bright light output.

d) Nixon, US 5,293,437. Nixon teaches a fiber optic display with direct driven optical fibers.

e) Joubert et al., US 5,526,063. Joubert teaches a video image projector with improve luminous efficiency.

f) Ishii et al., US 5,552,840. Ishii teaches a three-dimensional projection display reflecting divided polarized light on to reflective liquid crystal display elements.

g) Kojima et al., US 5,815,221. Kojima teaches a projection apparatus.

h) Baron, US 5,534,949. Baron teaches a two channel field sequential color display system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Michael J. Moyer** whose telephone number is **(703) 305-2099.** The examiner can normally be reached Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Steven Saras**, can be reached at **(703) 305-9720.**

Any response to this action should be mailed to:

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Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the **Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.**

Michael J. Moyer
Examiner
Art Unit 2675

MJM
January 11, 2003

STEVEN SARAS
SUPERVISORY PATENT EXAMINER
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